

## CLAIMS

1. A single-layer matte film or sheet comprising a polylactic acid resin composition containing a particulate substance, wherein at least one side of the film or sheet has a surface gloss of 60% or lower when measured in accordance with ASTM-D2457-70 (45° gloss).
2. The single-layer matte film or sheet according to claim 1, wherein the particulate substance is a chemically modified starch (B), and the film or sheet comprises a mixture containing 55 to 97 wt% of a polylactic acid resin (A), 2 to 30 wt% of the chemically modified starch (B), and 1 to 15 wt% of a plasticizer (C).
3. The matte film or sheet according to claim 2, wherein the chemically modified starch (B) is a starch derivative mixture containing 40 wt% or more of at least one starch derivative (b) selected from the group consisting of starch ester, starch ether, and polyester graft polymer starch.
4. The matte film or sheet according to claim 3, wherein the starch derivative (b) has a glass transition temperature  $T_g$  of 100 to 170°C.
5. The matte film or sheet according to any one of claims 2 to 4, wherein the film or sheet has a micro phase-separation structure in which the polylactic acid resin (A) forms a matrix and the chemically modified starch (B) forms a domain, and in a cross-section cut in the transverse direction of the film or sheet

(referred to as TD cross-section), an average of the cross-sectional areas of larger first 20% domains when the cross-sectional areas are count down among all the domains of the chemically modified starch (B) is 20,000 nm<sup>2</sup> or larger.

6. The matte film or sheet according to any one of claims 2 to 5, wherein the plasticizer (C) is an ester synthesized from a combination of two or more compounds selected from the group consisting of an aliphatic carboxylic acid having 7 or less carbon atoms, an aliphatic hydroxycarboxylic acid having 7 or less carbon atoms, and an aliphatic alcohol having 7 or less carbon atoms.

7. The matte film or sheet according to any one of claims 2 to 6, further comprising 5 wt% or less of a particulate polymer (D) having an average particle size of 10  $\mu$ m or smaller based on 100 wt% in total of the polylactic acid resin (A), the chemically modified starch (B) and the plasticizer (C).

8. A multilayered matte film or sheet comprising the matte film or sheet according to any one of claims 1 to 7 stacked so that the surface having a surface gloss of 60% or less is at least one external surface.

9. The single-layer matte film or sheet according to claim 1, wherein the particulate substance is a starch (E), and the film or sheet comprises a mixture containing 45 to 97.5 wt% of a polylactic acid resin (A), 2 to 40 wt% of the starch (E), and 0.5 to 15

wt% of a plasticizer (C).

10. The matte film or sheet according to claim 9, wherein the film or sheet has a micro phase-separation structure in which the polylactic acid resin (A) forms a matrix and the starch (E) forms a domain.

11. The matte film or sheet according to any one of claims 9 and 10, wherein the plasticizer (C) is a mixed plasticizer containing 10 to 90 wt% an aliphatic polyhydric alcohol having two or more hydroxyl groups in the molecule and 10 or less carbon atoms.

12. The matte film or sheet according to any one of claims 9 to 11, further comprising 5 wt% or less of a particulate polymer (D) having an average particle size of 10  $\mu\text{m}$  or smaller based on 100 wt% in total of the polylactic acid resin (A), the starch (E) and the plasticizer (C).

13. A multilayered matte film or sheet comprising the matte film or sheet according to any one of claims 9 to 12 stacked so that the surface having a surface gloss of 60% or less is at least one external surface.

14. The single-layer matte film or sheet according to claim 1, wherein the particulate substance is a particulate polymer (D), and the film or sheet comprises a mixture containing 70 to 99 wt% of a polylactic acid resin (A) and 1 to 30 wt% of the particulate polymer (D).

15. The single-layer matte film or sheet according to claim 1, wherein the particulate substance

is a particulate polymer (D), and the film or sheet comprises a mixture containing 55 to 99 wt% of a polylactic acid resin (A), 1 to 30 wt% of the particulate polymer (D), and 15 wt% or less of a plasticizer (C).

16. The matte film or sheet according to claim 14 or 15, wherein the particulate polymer (D) has an average particle size of 10  $\mu\text{m}$  or smaller.

17. The matte film or sheet according to any one of claims 14 to 16, wherein the plasticizer (C) is an ester synthesized from a combination of two or more compounds selected from the group consisting of an aliphatic carboxylic acid, an aliphatic hydroxycarboxylic acid, and an aliphatic alcohol.

18. A multilayered matte film or sheet comprising the matte film or sheet according to any one of claims 14 to 17 stacked so that the surface having a surface gloss of 60% or less is at least one external surface.

19. The matte film or sheet according to claim 1, wherein the particulate substance is an inorganic filler (F), and the film or sheet comprises a mixture containing 70 to 99.5 wt% of a polylactic acid resin (A) and 0.5 to 30 wt% of the inorganic filler (F).

20. The single-layer matte film or sheet according to claim 1, wherein the particulate substance is an inorganic filler (F), and the film or sheet comprises a mixture containing 55 to 99.5 wt% of a polylactic acid resin (A), 0.5 to 30 wt% of the

inorganic filler (F), and 15 wt% or less of a plasticizer (C).

21. The matte film or sheet according to claim 19 or 20, wherein the inorganic filler (F) has an average particle size of 10  $\mu\text{m}$  or smaller.

22. The matte film or sheet according to any one of claims 19 to 21, wherein the plasticizer (C) is an ester synthesized from a combination of two or more compounds selected from the group consisting of an aliphatic carboxylic acid, an aliphatic hydroxycarboxylic acid, and an aliphatic alcohol.

23. The matte film or sheet according to any one of claims 19 to 22, further comprising 5 wt% or less of a particulate polymer (D) having an average particle size of 10  $\mu\text{m}$  or smaller based on 100 wt% in total of the polylactic acid resin (A), the inorganic filler (F) and the plasticizer (C).

24. A multilayered matte film or sheet comprising the matte film or sheet according to any one of claims 19 to 23 stacked so that the surface having a surface gloss of 60% or less is at least one external surface.

25. A method for manufacturing the matte film or sheet according to any one of claims 1 to 24, comprising the steps of: selecting a resin nonadhesive to at least one surface of the matte film or sheet; bringing the nonadhesive resin layer into contact with at least the one surface of the matte film or sheet; forming a co-extrusion film or sheet containing the at

least one nonadhesive resin layer, and then removing the nonadhesive resin layer to obtain the matte film or sheet.

26. A packaging material comprising the matte film or sheet according to any one of claims 1 to 24.

27. An agricultural material comprising the matte film or sheet according to any one of claims 1 to 24.

28. Wall paper comprising the matte film or sheet according to any one of claims 1 to 24 stacked on the surface.

29. A screen comprising the matte film or sheet according to any one of claims 1 to 24 stacked on the surface.

30. An interior decoration comprising the matte film or sheet according to any one of claims 1 to 24 stacked on the surface.

31. A commodity, a school supply, a stationery or a notebook comprising the matte film or sheet according to any one of claims 1 to 24 stacked on the surface.

32. A paper product or a paper container comprising the matte film or sheet according to any one of claims 1 to 24 stacked on the surface.

33. A fabric product, a textile product or a table cloth comprising the matte film or sheet according to any one of claims 1 to 24 stacked on the surface.